

Appl. No. : 10/705,548
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AMENDMENTS TO THE CLAIMS

A complete listing of all claims is presented below.

1. (Currently Amended) A multi-zonal monofocal ophthalmic lens comprising:
an optic comprising a plurality of zones, including:
an inner zone having a first optical power;
an intermediate zone surrounding the inner zone and having a second optical power
that is different from the first power by a magnitude that is less than at least
about 0.75 Diopter; and
an outer zone surrounding the intermediate zone having a third optical power
different from the second optical power;
the plurality of zones all disposed such that all light entering the inner zone, the
intermediate zone, and the outer zone of the monofocal ophthalmic lens light entering the entire
optic from a distant point source is focused to substantially a single point.
2. (Previously presented) The multi-zonal monofocal ophthalmic lens of claim 1, wherein, the
third optical power is equal to the first optical power.
3. (Previously presented) The multi-zonal monofocal ophthalmic lens of claim 1, wherein the
second power differs from the first power by a magnitude that is less than or equal to about 0.65
Diopter.
4. (Previously presented) The multi-zonal monofocal ophthalmic lens of claim 1, wherein the
inner zone comprises a spherical surface and the intermediate zone comprises an aspherical
surface.
5. (Currently Amended) The multi-zonal monofocal ophthalmic lens of claim 1, further
comprising:
an outer zone surrounding the intermediate zone and having a third power wherein the
second power differs from both the first and third powers by a magnitude that is less than or
equal to at least about 0.75 Diopter.
6. (Previously presented) The multi-zonal monofocal ophthalmic lens of claim 5, wherein the
second power differs from both the first and third powers by a magnitude that is less than or equal
to about 0.65 Diopter.

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7. (Previously presented) The multi-zonal monofocal ophthalmic lens of claim 5, wherein the inner zone comprises a spherical surface and the intermediate zone comprises an aspherical surface.

8. (Previously presented) The multi-zonal monofocal ophthalmic lens of claim 7, wherein the outer zone comprises an aspherical surface.

9. (Currently Amended) The multi-zonal monofocal ophthalmic lens of claim 1, further comprising:

multiple outer zones surrounding the intermediate zone, wherein each zone in the lens has a power that differs from the power of the adjacent zone(s) by a magnitude that is less than or equal to at least about 0.75 Diopter.

10. (Previously presented) The multi-zonal monofocal ophthalmic lens of claim 9, wherein there are between 3 and 7 total zones.

11. (Previously presented) The multi-zonal monofocal ophthalmic lens of claim 1, wherein the ophthalmic lens is an intraocular lens and includes haptics.

12. (Currently Amended) A multi-zonal monofocal intraocular lens ~~having an optic with a plurality of discrete concentric optical zones centered on the optical axis, the zones adapted to focus incoming light rays to form an image from an object~~, comprising:

an optic comprising an optical axis, including:

an inner zone overlapping the optical axis ~~of the lens for producing an image when~~

the intraocular lens is centered on the optical axis of the human eye; and

a first surrounding zone concentric about the inner zone and adapted to compensate

for optical aberrations in the image resulting from implanted intraocular lens

decentration of greater than at least about 0.1 mm;

the inner zone and the first surrounding zone disposed such that ~~all light entering the inner zone and the first surrounding zone of the monofocal ophthalmic lens~~ light entering the entire optic from a distant point source is focused to substantially a single point.

13. (Original) The multi-zonal monofocal intraocular lens of claim 12, wherein the first surrounding zone compensates for optical aberrations in the image resulting from implanted intraocular lens decentration of greater than about 0.4 mm.

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14. (Original) The multi-zonal monofocal intraocular lens of claim 12, wherein the first surrounding zone compensates for optical aberrations in the image resulting from implanted intraocular lens decentration of greater than about 0.5 mm.

15. (Original) The multi-zonal monofocal intraocular lens of claim 12, wherein the first surrounding zone also compensates for optical aberrations in the image resulting from implanted intraocular lens tilt of greater than at least about 1 degree.

16. (Original) The multi-zonal monofocal intraocular lens of claim 12, wherein the first surrounding zone also compensates for optical aberrations in the image resulting from implanted intraocular lens tilt of greater than at least about 5 degrees.

17. (Original) The multi-zonal monofocal intraocular lens of claim 12, wherein the first surrounding zone also compensates for optical aberrations in the image resulting from implanted intraocular lens tilt of greater than at least about 10 degrees.

18. (Currently Amended) The multi-zonal monofocal intraocular lens of claim 12, wherein the power of the first surrounding zone differs from the power of the inner zone by a magnitude that is less than or equal to ~~or less than~~ about 0.75 Diopter.

19. (Original) The multi-zonal monofocal intraocular lens of claim 12, wherein the inner zone comprises a spherical surface and the first surrounding zone comprises an aspherical surface.

20. (Currently Amended) The multi-zonal monofocal intraocular lens of claim 12, further comprising:

at least one other zone outside of the first surrounding zone, wherein each zone in the lens has a power that differs from the power of any other zone by a magnitude that is less than or equal to ~~at least~~ about 0.75 Diopter.

21. (Original) The multi-zonal monofocal intraocular lens of claim 20, wherein there are between 3 and 7 total zones.

22. (Previously presented) A method of designing a multi-zonal monofocal ophthalmic lens, comprising:

providing an optical model of the human eye;

providing an optical model of a lens comprising an inner zone, an intermediate zone, an outer zone, and zonal design parameters, the inner zone, the intermediate zone, and the outer zone disposed such that all light entering the inner zone, the intermediate zone, and the outer

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zone of the monofocal ophthalmic lens from a distant point source is focused to substantially a single point.; and

adjusting the zonal design parameters based on an image output parameter for one or more non-optimal states of the lens.

23. (Original) A method as in claim 22, further including testing the intraocular lens over a plurality of corneal surface variations and dispositions of optical elements in the eye's optical system using tolerance analyzing techniques.

24. (Original) A method as in claim 22, further comprising repeating at least a portion of the method to modify zonal parameters and achieve a better average optical performance.

25. (Currently Amended) A multi-zonal monofocal ophthalmic lens comprising:

an optic comprising a plurality of zones, including:

an inner zone having a first optical power;

an intermediate zone surrounding the inner zone and having a second optical power that is different from the first power by a magnitude that is less than at least about 0.75 Diopter; and

an outer zone surrounding the intermediate zone having a third optical power different from the second optical power;

the plurality of zones disposed such that ~~all light from a distant point source entering the inner zone, the intermediate zone, and the outer zone of the lens~~ light entering the entire optic from a distant point source substantially[[fall]] falls within the range of the depth-of-focus of a spherical lens having an equivalent focal length.

26. (Previously presented) The multi-zonal monofocal intraocular lens of claim 25, wherein the inner zone, the intermediate zone, and the outer zone of the monofocal ophthalmic lens each have a relative refractive power, the relative refractive powers being within the range of the depth-of-focus of a spherical monofocal intraocular lens.

27-30 (Cancelled)

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31. (Currently Amended) The multi-zonal monofocal intraocular lens ~~of claim 27, wherein,~~
comprising:

an optic comprising plurality of zones, including:

an inner zone overlapping the optical axis of the lens for producing an image when
the intraocular lens is centered on the optical axis of the human eye; and
a first surrounding zone concentric about the inner zone and adapted to compensate
for optical aberrations in the image resulting from implanted intraocular lens
decentration of greater than about 0.1 mm;

the inner zone comprises a spherical surface and the first surrounding zone comprises an aspherical surface.

32. (New) A multi-zonal monofocal intraocular lens, comprising:

an optic comprising an optical axis, including:

an inner zone overlapping the optical axis for producing an image when the
intraocular lens is centered on the optical axis of the human eye; and
a first surrounding zone concentric about the inner zone and adapted to compensate
for optical aberrations in the image resulting from implanted intraocular lens
decentration of greater than about 0.1 mm;

the inner zone and the first surrounding zone disposed such that light entering the entire optic from a distant point source substantially falls within the range of the depth-of-focus of a spherical lens having an equivalent focal length.